a roughness of about 220 nm. <u>However, optical components typically require reflecting surfaces with a roughness less than about 50 nm.</u>

<u>IN THE CLAIMS</u>

Please amend the Claims as follows:

96. (Amended) A method of forming an optical component, comprising:

forming a mask over a light transmitting medium so as to protect a region of the light transmitting medium where a waveguide is to be formed; and

applying an etching medium including [a fluorine-containing gas, one or more partial passivants] SF_6, HBr and oxygen to the light transmitting medium so as to form one or more waveguide surfaces with a smoothness less than 220 nm.

97. (Canceled).

98. (previously presented) The method of claim 96, wherein the fluorine-containing gas is selected from a group consisting of SF_6, Si_2F_6 and NF_3.

99. (previously presented) The method of claim 96, wherein the partial passivant is selected from a group consisting of HBr, SiF_4, C_4F_8, CH_2F_2 and CHF_3.

100. (previously presented) The method of claim 96, wherein the one or more surfaces includes a sidewall of the waveguide.

101. (previously presented) The method of claim 96, wherein the one or more surface includes a waveguide facet.

102. (previously presented) The method of claim 96, wherein the etching medium is applied at a pressure of 1 mTorr to 600 mTorr.

103. (previously presented) The method of claim 96, wherein the etching medium is applied at a pressure of 1 mTorr to 60 mTorr.

104. (previously presented) The method of claim 96, wherein the etching medium is applied at a pressure of 10 mTorr to 30 mTorr.

105. (previously presented) The method of claim 96, wherein the etching medium includes one or more other media.

106. (previously presented) The method of claim 96, wherein the one or more other media is selected from the group consisting of SiF_4 and SiF_6

107. (previously presented) The method of claim 96, wherein the one or more other media include a noble gas.

108. (previously presented) The method of claim 96, wherein the etching medium has a molar ratio of partial passivant to fluorine-containing gas of 0.1 to 100.

109. (previously presented) The method of claim 96, wherein the etching medium has a molar ratio of partial passivant to fluorine-containing gas of .5 to 20.

110. (previously presented) The method of claim 96, wherein the etching medium has a molar ratio of fluorine-containing gas to oxygen of .1 to 10.

111. (previously presented) The method of claim 96, wherein the mask is formed so as to protect a region of the light transmitting medium where a plurality of waveguides are to be formed and the etching medium is applied to as to form one or more surfaces on at least one of the waveguides.

112. (previously presented) The method of claim 96, wherein the mask is an oxide mask.

113. (previously presented) The method of claim 96, wherein the etching medium is applied in an inductively coupled plasma etch.

114. (previously presented) The method of claim 96, wherein the waveguide is formed on a wafer having one or more dimensions with a length greater than 6 inches.

115. (previously presented) The method of claim 96, wherein the waveguide is formed on a wafer having one or more dimensions with a length of at least 8 inches.

116. (previously presented) The method of claim 96, wherein the one or more surfaces are formed with a smoothness of at most 25 nm.

117. (previously presented) The method of claim 96, wherein the etching medium is applied continuously during formation of the one or more surfaces.

118. (previously presented) The method of claim 96, wherein the light transmitting medium is silicon.

119. (previously presented) The method of claim 96, wherein the etching medium is applied such that the fluorine containing gas has a uniformity of 20% or less across the surface of the wafer.

120. (previously presented) The method of claim 96, wherein the etching medium is applied such that the fluorine containing gas has a uniformity of 10% or less across the surface of the wafer.

121. (previously presented) The method of claim 96, wherein the partial passivant includes CHF_3.

122. (previously presented) The method of claim 121, wherein the fluorine-containing includes SF_6.

123. (previously presented) The method of claim 96, wherein the partial passivant includes C_4F_8.

124. (previously presented) The method of claim 123, wherein the fluorine-containing includes SF_6.

125. (Amended) A method of forming an optical component, comprising:

obtaining an optical component having a light transmitting medium positioned over a base; and

applying an etching medium including [a fluorine-containing gas, a partial passivant] <u>SF_6, HBr</u> and Oxygen to the light transmitting medium so as to form one or more waveguide surfaces with a smoothness less than 220 nm.

126. (Canceled).

127. (previously presented) The method of claim 125, wherein the fluorine-containing gas is selected from a group consisting of SF_6, Si_2F_6 and NF_3.

128. (previously presented) The method of claim 125, wherein the partial passivant is selected from a group consisting of HBr, SiF_4, C_4F_8, CH_2F_2 and CHF_3.

129. (previously presented) The method of claim 125, wherein the etching medium is applied at a pressure of 1 mTorr to 200 mTorr.

130. (previously presented) The method of claim 125, wherein the etching medium is applied at a pressure of 5 mTorr to 60 mTorr.

131. (previously presented) The method of claim 125, wherein the etching medium includes a second fluorine-containing gas selected from the group consisting of SiF_4 and SiF_6.

132. (previously presented) The method of claim 125, wherein the etching medium also includes a noble gas.

133. (previously presented) The method of claim 125, wherein the etching medium has a molar ratio of partial passivant to fluorine-containing gas of 0.1 to 100.

134. (previously presented) The method of claim 125, wherein the etching medium has a molar ratio of partial passivant to fluorine-containing gas of .5 to 20.

135. (previously presented) The method of claim 125, wherein the etching medium has a molar ratio of fluorine-containing gas to oxygen of .1 to 10.

136. (previously presented) The method of claim 125, wherein the mask is formed so as to protect a region of the light transmitting medium where a plurality of waveguides are to be formed and the etching medium is applied to as to form one or more surfaces on at least one of the waveguides.

137. (previously presented) The method of claim 125, wherein the etching medium is applied so as to form at least one surface on a plurality of waveguides.

138. (previously presented) The method of claim 125, wherein the etching medium consists of only SF6 as the fluorine-containing gas, HBr as the partial passivant and Oxygen.

139. (previously presented) The method of claim 125, wherein the etching medium is applied in an inductively coupled plasma etch.

140. (previously presented) The method of claim 125, wherein the waveguide is formed on a wafer having one or more dimensions with a length greater than 6 inches.

141. (previously presented) The method of claim 125, wherein the waveguide is formed on a wafer having one or more dimensions with a length of at least 8 inches.

142. (previously presented) The method of claim 125, wherein the one or more surfaces are formed with a smoothness of at most 25 nm.

143. (previously presented) The method of claim 125, wherein the etching medium is applied continuously during formation of the one or more surfaces.

144. (previously presented) The method of claim 125, wherein the light transmitting medium is silicon.

145. (previously presented) The method of claim 125, wherein the etching medium is applied such that the fluorine containing gas has a uniformity of 20% or less across the surface of the wafer.

146. (previously presented) The method of claim 125, wherein the etching medium is applied such that the fluorine containing gas has a uniformity of 10% or less across the surface of the wafer.

147.- 168. (Canceled).

169. (New) The method of claim 96, wherein the one or more surfaces are formed with a smoothness of at most 50 nm.

170. (New) The method of claim 96, wherein the one or more surfaces are formed in a single etch step.

171. (New) The method of claim 96, wherein the etching medium is applied continuously during formation of the one or more surfaces.

172. (New) The method of claim 96, wherein conditions under which the etching medium is applied remain constant during the formation of the one or more surfaces.

173. (New) The method of claim 96, wherein a gas flow ratio of SF_6:HBr:oxygen remains constant during the formation of the one or more surfaces.

174. (New) The method of claim 96, wherein a pressure at which the etching medium is applied remains constant during the formation of the one or more surfaces.

175. (New) The method of claim 125, wherein the one or more surfaces are formed with a smoothness of at most 50 nm.

176. (New) The method of claim 125, wherein the one or more surfaces are formed in a single etch step.

177. (New) The method of claim 125, wherein the etching medium is applied continuously during formation of the one or more surfaces.

178. (New) The method of claim 125, wherein conditions under which the etching medium is applied remain constant during the formation of the one or more surfaces.

179. (New) The method of claim 125, wherein a gas flow ratio of SF_6:HBr:oxygen remains constant during the formation of the one or more surfaces.

180. (New) The method of claim 125, wherein a pressure at which the etching medium is applied remains constant during the formation of the one or more surfaces.

REMARKS

Paragraph [0007] is amended to specify that the "optical components typically require reflecting surfaces with a roughness less than about 50 nm." This quote is extracted from page 3, lines 9-12 of U.S. Patent application serial number 09/690,959 which is incorporated into the